



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/676,949	10/02/2000	Tomochika Murakami	35.G2675	4648

5514 7590 08/29/2003

FITZPATRICK CELLA HARPER & SCINTO  
30 ROCKEFELLER PLAZA  
NEW YORK, NY 10112

EXAMINER

PATEL, SHEFALI D

ART UNIT PAPER NUMBER

2621

DATE MAILED: 08/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/676,949

Applicant(s)

MURAKAMI ET AL.

Examiner

Shefali d Patel

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☒ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_. 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority*

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in JAPAN on November 18, 1999. It is noted, however, that applicant has not filed a certified copy of the 328427/1999 application as required by 35 U.S.C. 119(b).

### *Information Disclosure Statement*

2. The information disclosure statement filed January 3, 2001 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office on PTO-1449. It has been placed in the application file, but the information referred to therein has not been considered. Please provide a PTO-1449 in response to this action.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 6, 8-12, 14-24, 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manjunath et al. (hereinafter, "Manjunath") (USPN 6,332,030 B1) in view of Naka et al. (hereinafter, "Naka") (USPN 5,168,352).

With regard to **claim 1** Manjunath discloses an image processing device for embedding digital watermark information in a gray-scale image (embedding in a gray scale signature image, see col. 7 lines 26-37), comprising: input means for inputting gray-scale image data (input means

Art Unit: 2621

to input a host image in element 20 in Fig. 6) in which each pixel is formed of one component (each pixel is a form of one component in a gray-scale image, “one byte per pixel” see, col. 7 lines 26-27); embedding means (disclosed at 20 in Fig. 6, col. 10 lines 54-55) for embedding the digital watermark information in part of the components of the color image data (color image embedding, see col. 13 lines 38-43. Embed watermark information in part of the components of the color image, see col. 14 lines 35-38) (obtained by said converting means). Manjunath does not expressly disclose converting means for converting the format of the gray-scale image data into color image data in which each pixel is formed of a plurality of components. Naka discloses converting means (generating means 12 in Fig. 1) for converting the format of the gray-scale image data into color image data (converting or “transforming” monochromatic (gray scale image is monochromatic) image into color image, see col. 3 lines 9-27) in which each pixel is formed of a plurality of components (each pixel in a color image is a form of plurality of components, “trichromatic components” see col. 3 lines 19-21). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Naka with Manjunath. The motivation for doing so is to decrease the human perception to the embedded image. It is conventional in the art that the color image is less sensitive to human visual system than the gray-scale image. Therefore, it would have been obvious to combine Naka with Manjunath to obtain the invention as specified in claim 1.

**Claim 8** recites identical features as claim 1 except claim 8 is a method claim. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 8.

**Claim 9** recites identical features as claim 1 except claim 9 is a storage-medium claim. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 9.

Art Unit: 2621

Applicants' attention is invited to the embedding algorithm disclosed in Manjunath at col. 12 line 15. Naka also discloses a storage medium within the generating means 12 see, col. 3 lines 22-24.

**Claim 24** is rejected the same as claim 1. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 24. Claim 24 distinguishes from claim 1 only in that it recites a color component extracting unit that separates a part of the plurality of components from the remaining components of the color image data. Manjunath discloses a color component extracting unit (col. 13 lines 40-43 and also disclosed at 24 in Fig. 6) that separates a part of the plurality of components from the remaining components of the color image data (this process is disclosed in Fig. 8. Also, the encoder embeds the part of the plurality of component at col. 14 lines 35-38 and decoder extracts the embedded component at col. 11 lines 38-40).

With regard to **claim 2** it is conventional (and according to Naka at col. 1 lines 34-35) that the each pixel in the color image data includes red, green and blue components.

With regard to **claim 3** Manjunath discloses each pixel in the color image data including brightness (brightness is the luminance part of the signal at col. 14 lines 9-10) and chrominance components (col. 14 lines 10-11).

With regard to **claim 4** it is conventional (and according to Naka at col. 1 lines 34-36) that the each pixel in the color image data includes yellow, magenta, and cyan components.

With regard to **claim 6** Manjunath discloses encoding means (col. 13 line 30) for compressing (col. 14 lines 26-31) and encoding the color image data (col. 14 lines 35-38) including the brightness and the chrominance components (col. 14 lines 9-11).

With regard to **claim 10** Manjunath discloses embedding means that embeds the digital watermark information in the blue component at col. 2 lines 46-51.

With regard to **claim 11** Manjunath discloses embedding means (disclosed at 20 in Fig. 6, col. 10 lines 54-55) that embeds the digital watermark information in the chrominance component (color image (that includes the chrominance component) embedding, see col. 13 lines 38-43.)

With regard to **claim 12** Manjunath discloses embedding means embedding a part of the digital watermark information in a part of the color image data (col. 14 lines 35-38) in such a manner that the overall gray level of the image is not changed (obtaining a “robust” image after embedding see, col. 14 lines 38-42).

**Claim 14** recites identical features as claim 2 except claim 14 is a method claim. Thus, arguments similar to that presented above for claim 2 is equally applicable to claim 14.

**Claim 15** recites identical features as claim 10 except claim 15 is a method claim. Thus, arguments similar to that presented above for claim 10 is equally applicable to claim 15.

**Claim 16** recites identical features as claim 3 except claim 16 is a method claim. Thus, arguments similar to that presented above for claim 3 is equally applicable to claim 16.

**Claim 17** recites identical features as claim 11 except claim 17 is a method claim. Thus, arguments similar to that presented above for claim 11 is equally applicable to claim 17.

**Claim 18** recites identical features as claim 12 except claim 18 is a method claim. Thus, arguments similar to that presented above for claim 12 is equally applicable to claim 18.

**Claim 19** recites identical features as claim 2 except claim 19 is a storage medium claim. Thus, arguments similar to that presented above for claim 2 is equally applicable to claim 19.

**Claim 20** recites identical features as claim 10 except claim 20 is a storage medium claim. Thus, arguments similar to that presented above for claim 10 is equally applicable to claim 20.

**Claim 21** recites identical features as claim 3 except claim 21 is a storage medium claim. Thus, arguments similar to that presented above for claim 3 is equally applicable to claim 21.

**Claim 22** recites identical features as claim 17 except claim 22 is a storage medium claim. Thus, arguments similar to that presented above for claim 17 is equally applicable to claim 22.

**Claim 23** recites identical features as claim 12 except claim 23 is a storage medium claim. Thus, arguments similar to that presented above for claim 12 is equally applicable to claim 23.

**Claim 26** recites identical features as claim 2. Thus, arguments similar to that presented above for claim 2 is equally applicable to claim 26.

**Claim 27** recites identical features as claim 10. Thus, arguments similar to that presented above for claim 10 is equally applicable to claim 27.

**Claim 28** recites identical features as claim 3. Thus, arguments similar to that presented above for claim 3 is equally applicable to claim 28.

With regard to **claim 29** Manjunath discloses color component extracting unit that extracts at least a part of the chrominance component (col. 13 lines 40-43 and also disclosed at

Art Unit: 2621

24 in Fig. 6; this process is disclosed in Fig. 8.: decoder extracts the embedded component at col. 11 lines 38-40) and said embedding unit (disclosed at 20 in Fig. 6, col. 10 lines 54-55) adds the digital watermark information to the extracted part of the chrominance component (color image (that includes the chrominance component) embedding, see col. 13 lines 38-43.).

**Claim 30** recites identical features as claim 6. Thus, arguments similar to that presented above for claim 6 is equally applicable to claim 30.

5. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Manjunath in view of Naka as applied to claims 1-4, 6, 8-12, 14-24, 26-30 above, and further in view of Kawakami et al. (hereinafter, "Kawakami") (USPN 5,652,626).

With regard to **claim 25** Manjunath discloses the extracting unit as described above in claim 24. Manjunath does not expressly disclose a color component synthesizer for recombining the part of the plurality of components to which the digital watermark information is added with the remaining components of the color image data. However, Kawakami discloses a color component synthesizer (element 1610 in Fig. 17 B and see col. 27 lines 22-26) for recombining the part of the plurality of components (to which the digital watermark information) is added with the remaining components of the color image data (see adder 1612 in Fig. 17B and also col. 27 lines 29-32). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Kawakami with Manjunath. The motivation for doing so is that when one of the component is being extracted, one needs to have a synthesizer (i.e., combiner) to add in the data back in the image to have an original image with digital watermark



Art Unit: 2621

information as a result.. Therefore, it would have been obvious to combine Kawakami with Manjunath to obtain the invention as specified in claim 25.

6. Claim 5, 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manjunath in view of Naka as applied to claims 1-4, 6, 8-12, 14-24, 26-30 above, and further in view of Zador (USPN 6,125,201).

With regard to **claim 5** Naka, as mentioned in claim 1 above in paragraph 4, Naka discloses converting means (generating means 12 in Fig. 1) for converting the format of the gray-scale image data into color image data (converting or “transforming” monochromatic (gray scale image is monochromatic) image into color image, see col. 3 lines 9-27). Naka does not expressly disclose further converting means for converting the color image data into other color image data in which each pixel includes brightness and chrominance components. However, Zador discloses converting means (color conversion means 24 in Fig. 1) for converting the color image data into other color image data (converting a RGB image into Y-Cr-Cb image. See, col. 7 lines 11-15) in which each pixel includes brightness and chrominance components (Y is the brightness (i.e., luminance) and Cr-Cb is the chrominance). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Zador with Naka. The motivation for doing so is that the Y-Cr-Cb color space is employed as it is less redundant than RGB color space and is closer to the Hue-Saturation-Brightness (HSB) color space, which the human visual perception system employs as suggested by Zador at col. 7 lines 18-23; also, in HSB and Y-Cr-Cb color space, the hue and saturation values of every point will be identical in the image, and only the brightness values will change due to illumination as

Art Unit: 2621

taught by Zador at col. 7 lines 39-43. Therefore, it would have been obvious to combine Zador with Naka to obtain the invention as specified in claim 5.

With regards to **claim 7**, the recited features are the same as those in claim 6, and the arguments in paragraph 4 above as to the relevance of Manjunath and Naka are incorporated herein.

With regard to **claim 13** Manjunath discloses embedding means (disclosed at 20 in Fig. 6, col. 10 lines 54-55) that embeds the digital watermark information in a manner such that the information is not lost when said encoding means compresses and encodes the color image data (after the encoding and compressing the image is robust and not distorted col. 14 lines 35-42).

### *Conclusion*

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

USPN 6,590,996 -- Color adaptive watermarking.

USPN 5,332,968 – Magnetic Resonance Imaging color composites, See Figs 1-2 and it's respective portion in the specification.

USPN 5,534,915 – Method of color enhancing a monochrome image using multiple base colors for selected regions of the monochrome image.

Chae et al., Color Image Embedding using Multidimensional Lattice Structures, 1998, IEEE, pp. 460-464.


Art Unit: 2621

Piva et al., Exploiting the cross-correlation of RGB-channels for robust watermarking of color images, 1999, IEEE, pp. 306-310.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shefali d Patel whose telephone number is 703-306-4182. The examiner can normally be reached on M-F 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

  
Daniel G. Mariam  
Primary Examiner  
Art Unit 2621

Shefali Patel  
August 21, 2003